Transloading – Part Two

Getting Crude Oil to the Refinery

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Introduction

When your well is located in the vast wilderness of the northern Midwest there aren't going to be any pipelines to refineries close by, which means you need to move the crude yourself. Oh sure, it can be as painful a process as it sounds but if you prepare ahead of time the transport can go more smoothly. Transloading is the process of transferring a shipment from one mode of transportation to another. The term is used when one transportation mode, in this case a tanker truck, cannot be used for the entire journey. So product will be transloaded from the trucks into approximately 120 connected rail cars. While transloading, there's always the possibility of a spill and that's why you need to call in an expert to build a terminal specifically for transloading that will keep you, your workers and the environment safe from the inherent dangers of this type of work.

Transloading

Transloading crude oil can be a tricky process. Once the oil is extracted from the well, it's sent in trucks to a terminal with a rail spur and about 120 connected rail cars. The terminal should have all the safety measures in place to protect workers as well as protecting the terminal area in case there is a spill. The rail cars carrying the crude oil will reach another destination, which is a terminal near the refinery. But the party isn't over just yet. At this point the train pulls onto a rail spur that leads to a terminal equipped for unloading into tanker trucks bound for the refinery.

Crude Oil

A terminal built for transloading crude oil will have the proper equipment such as loading racks, loading arms, whether top or bottom, hoses, sturdy non-slip platforms with gangways, ladders and more. This equipment's two main functions are to prevent injury to workers and to prevent damage to the environment from a spill.

Oil spills usually occur during the loading and unloading process while a worker attempts to connect or disconnect. That's why spill containment is an essential part of any terminal. Along the railroad tracks, spill containment track pans fulfill required environmental spill contamination regulations and help make it easier to clean up the spill quickly should one occur. These pans will also catch drips, spills, and leaks and can be placed end to end for continuous coverage. Pans are usually made from fiberglass or steel with steel being the preferred material because it's more durable. Many systems include one center and two side pans tied

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together with a cross drain. Stainless steel fasteners and neoprene rubber gaskets add to the quality and durability.

Once the rail car is in place, a pipe is connected to the bottom of the rail car on one end and the tanker connection on the other then gravity goes to work to unload. If the crude is taken from the top of the car then the pipe actually has to do the work drawing the crude oil out of the rail cars to deposit it into the tanker.

Soon after it's transloaded from rail car to tanker, the crude is once again on the move – this time to its final destination – the refinery. Loading and unloading crude oil into refinery tanks is one of the most critical activities at any refinery. The average refinery system has a series of tanks to store the oil, ports to accommodate boats or tankers delivering the crude oil and CDUs (Crude Distillation Units) where the crude oil mixtures are distilled.[1]

The refinery's system is made up of pipelines that connect the ports with the tanks and the tanks with the CDUs. Electric pumps help load and unload the crude.

Following is an overview of what happens once the crude oil reaches the refinery.

Before unloading:

- Configure the pipeline networks with valves, pumps and more so the crude will end up in the proper place for the refining process.
- Fill the pipelines with crude oil.
- Sample the crude for chemical analysis, as each source is slightly different.
- Measure the crude oil in the tank before unloading.
- Start unloading.
- Stop unloading.

After unloading:

- Configure the pipeline networks, this time closing valves, configuration and maintenance of pumps and more.
- Empty the pipelines.
- Measure the crude that has been unloaded into the refinery tanks.[1]

The crude oil in the refinery's storage tanks will be transferred to a blending manifold where it will be blended to the desired composition ratio range predetermined by production. Storage space, or lack thereof is another important problem in many refineries. The more oil that's found, the more tanks become necessary and the more offshoots of the pipeline are needed.

Pipelines are still the most efficient method for transporting crude oil. Whenever possible they're used to move crude oil from the wellhead to the gathering and

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processing facilities. From the facilities the oil then goes to refineries. Product pipelines ship gasoline, diesel fuel and jet fuel from the refinery to local distribution facilities. Because product pipelines are used to move several different products, the different types of products are shipped in batches. Adjoining batches mix once they come into contact. Then the mixed stream may be sent to a refinery, sold as a lower value product, or sold as mixture. Most product pipelines have standard product specifications. Individual additive packages are put in later at the distribution terminals.[3]

Expanding the existing pipeline up to an oil play's wellhead will make transporting the oil much efficient but will take time. Until then, some tried and true methods are being used for safe and cost effective delivery.

ENDNOTES

1 ©2009, Saharidis Georgios K. D. & Ierapetritou, Marianthi G., Department of Chemical and Biochemical Engineering, Rutgers University, "Scheduling of Loading and Unloading of Crude Oil in a Refinery with Optimal
Mixture Preparation" http://sol.rutgers.edu/staff/marianth/ie801155w.lowlink.pdf_v03.pdf
2 For photo. "Crude Oil, Fossil Fuels Photo Essay" http://geology.about.com/od/mineral_resources/ig/fossilfuels/fosfuelcrudeoil.htm
3 "Oil Pipelines" http://www.petrostrategies.org/Learning_Center/oil_transportation.htm

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